SHARP PC-1211
Pocket Computer

The pocket computer which has a whole new range of potential

Cassette Interface
**CE-121**

Pocket Computer
PC-1211

The compact "Giant" that handles a wide range of applications

Handy pocket computer employing BASIC language

Computers are no longer for professional use only. Sharp's advanced electronics technology presents the new pocket computer PC-1211. High-performance functions are packed into a slim, compact body. The PC-1211 is designed as an "interactive type" computer to meet your personal needs by employing the easy-to-understand BASIC language. Make full use of it with your originality.
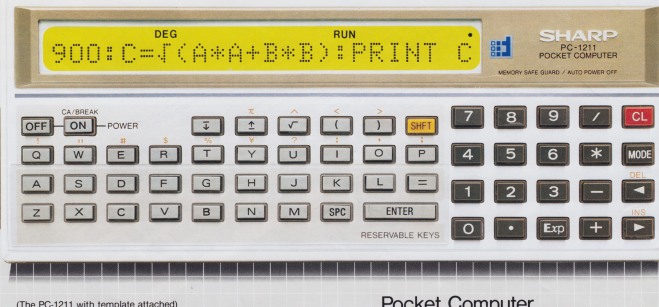
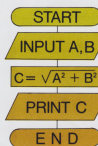(The PC-1211 with template attached)

Pocket Computer

PC-1211

The convenience of BASIC language

Programming can be performed easily by following the flow chart. Furthermore formulas can be put in as they are written. For program calculation just put in the variables. It's so easy!

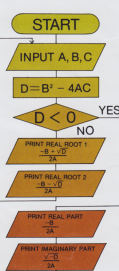### The Pythagorean theorem $C = \sqrt{A^2 + B^2}$

Flow chart

START
INPUT A,B
$C = \sqrt{A^2 + B^2}$
PRINT C
END

Key operation (PRO mode)	Display
10 INPUT A SHFT , B ENTER	10:INPUT A,B
20 C=√(A*A+B*B) ENTER	20:C=√(A*A+B*B)
30 PRINT C ENTER	30:PRINT C
40 END ENTER	40:END

Key operation (RUN mode)	Display
RUN ENTER	?
3 ENTER	?
4 ENTER	5.

Display panel — the window for "interaction". Even complicated calculation can be done easily.

A quadratic equation $AX^2 + BX + C = 0$

Flow chart

START
INPUT A,B,C
$D = B^2 - 4AC$
D < 0
PRINT REAL ROOT 1
PRINT REAL ROOT 2
PRINT REAL PART
PRINT IMAGINARY PART

Programming (PRO mode) (Display)	Key operation (RUN mode)	Display
10:INPUT "ENTER A";A;"ENTER B";B, "ENTER C";C	RUN ENTER	ENTER A
	4 ENTER	ENTER B
20:D=B*B-4*A*C	−1 ENTER	ENTER C
30:IF D<0GOTO 70	−1 ENTER	REAL ROOT1 6.40388E-01
40:PRINT "REAL ROOT1";(-B+√D)/(2*A)	ENTER	REAL ROOT2 -3.90388E-01
50:PRINT "REAL ROOT2";(-B-√D)/(2*A)	RUN ENTER	ENTER A
60:GOTO 10	5 ENTER	ENTER B
70:PRINT "REAL PART";-B/(2*A)	4 ENTER	ENTER C
80:PRINT "IMAG. PART";√(-D)/(2*A)	1 ENTER	REAL PART -0.4
90:GOTO 10	ENTER	IMAG. PART 0.2

Speedy operation with unique key systems.

Reservable key system

(Template)

Key operation (RUN mode)	Display
SHFT A (SIN)	SIN
30	SIN 30
+ SHFT S (COS)	SIN 30+COS
30	SIN 30+COS 30
ENTER	1.366025404

▲Convenience is increased if you reserve keys for certain functions or commands which are used frequently, and write them on the template for reference.

◄Calculations such as "SIN 30° + COS 30°" can be quickly done by incorporating the Reservable key system.

Definable key system

(Template)

Key operation (DEF mode)	Display
11 SHFT A	I= 11.
5 SHFT S	N= 5.
1000 SHFT D	PV= 1000.
SHFT F	FV= 1685.058155

▲Define frequently used programs with the definable mode. For example, you can define a program for compound interest calculation. i: interest rate, n: period, FV: future value, PV: present value
▲Simply input the variables to solve "What is the amount with interest added after 5 years at 11% of interest rate on a principal of $1,000"?
The PC-1211 handles the calculation quickly and simply.

PC-1211 handles high level calculation with simple operation.

Let's calculate a statistical values.
(Using the Definable key system, program calculation of linear regression can be done.)

[Calculation]

Get the coefficient a, b and correlation function r by applying two couples of data x_i and y_i to the index curve $y = ab^x$

$$\bar{x} = \sum x_i / n \ , \quad \bar{Y} = \sum \ln y_i / n$$
$$S_{xx} = \sum x_i^2 - n \bar{x}^2$$
$$S_{xY} = \sum x_i \ln y_i - n x \bar{Y}$$
$$S_{YY} = \sum (\ln y_i)^2 - n \bar{Y}^2$$
$$r = \frac{S_{xY}}{\sqrt{S_{xx} S_{YY}}} \ , \quad b' = \frac{S_{xY}}{S_{xx}}$$
$$a = e^{\bar{Y} - b' \bar{x}} \quad b = e^{b'}$$

[Example]

x	0.5	1.2	3.1	7.4
y	7.01	11.72	44.54	936.71

Apply this data to $y = ab^x$ and presume the case of $x = 8.3, -1.2$

Programming (PRO mode) (Display)

```
10:"A":FOR A=9TO 14
20:A(A)=0:NEXT A
30:PAUSE "DATA"
40:INPUT "X";Y"*X;Y
50:Y=LN Y
60:I=I+X:J=J+Y
70:K=K+X*X:L=L+X*Y
80:M=M+Y*Y:N=N+1
90:GOTO 40
100:"B":X=I/N:Y=J/N
110:K=K-N*X*X
120:L=L-N*X*Y
130:M=M-N*Y*Y
140:B=L/K:A=EXP. (Y-B*X)
150:B=EXP B
160:PRINT "R";L/√(K*M)
170:PRINT "a";A:PRINT "B";B
180:PRINT "ESTIMATION"
190:INPUT "X=";X
200:PRINT X;A*B^X
210:GOTO 190
220:END
```

Key operation (DEF mode)	Display		
SHFT A	X,Y		
	5 ENTER	X,Y	?
	7.01 ENTER	X,Y	?
	1.2 ENTER	X,Y	?
	11.72 ENTER	X,Y	?
	3.1 ENTER	X,Y	?
	44.54 ENTER	X,Y	?
	7.4 ENTER	X,Y	?
	936.71 ENTER	X,Y	?
SHFT B	R		9.99994E-01
	ENTER	a	4.960331916
	ENTER	B	2.03057723
	ENTER	ESTIMATION	
	ENTER	X=	
	8.3 ENTER		8.3 1773.179438
	ENTER	X=	
	−1.2 ENTER		-1.2 2.12015359

Adoption of BASIC language

For programming, the PC-1211 employs the BASIC language, used widely from beginners to professionals. This simple programming method can easily be carried out by referring to the flow chart. Moreover, formulas can be entered as they are normally written. These innovative functions are designed with ease of operation in mind.

The PC-1211 also serves as an ideal "stepping stone" to professional computers.

Dot matrix display — up to 24 digits with rolling writer

```
A= 3. B= 4. ANSWER C= 5.
```
[Output display]

Characters as well as numerals are displayed with the dot matrix display enabling the operator, in a sense, to communicate with the unit. The BASIC language can be used to its full potential. The display panel makes it possible to display portions of the program (line by line), visual instructions asking for data and showing calculation results.

Program capacity 1424 steps · 26 memories with memory safe guard

The PC-1211 has a large memory capacity in spite of its slim, compact body. Due to the memory safe guard circuit, information in memory is maintained even after the power is turned off.

Programming is by an efficient "one-command, one-step" system. According to your needs, steps can also be used as a memory.

(8 steps is equivalent to 1 memory)

Reservable key and definable key systems

- The reservable key system makes it possible to reserve a key for a function or command which is used frequently. It can easily be recalled by the touch of a key, when putting in a formula either during manual calculation or programming.

- The definable key system defines 18 programs for each key. Whenever you need a certain program, you can recall and run it with the touch of the proper key.

Smooth key operation with typewriter key arrangement

The PC-1211 employs a key arrangement similar to that of a typewriter. Thus the neat, clean appearing keyboard can be operated easily and quickly.

Programs and data can be saved in and loaded from a tape recorder

CE-121 (option)

PC-1211

The cassette tape recorder can be used as an external memory device. (Cassette interface CE-121 is optional) By saving programs or data on a cassette tape, the information can be loaded whenever necessary. It is also possible to search the saved program data automatically by file name or load it for use during the program calculation.

Other features

- Long-life operation, Auto power-off function.
- Playback function enables correction by displaying the formula with a single touch of a key.
- Effective tone function is designed to identify the program. (A beep sound can be input during programming.)

Applications

(Mathematics)
- Simultaneous equations
- Inverse matrix
- Determinant
- Product of matrices
- Mutual conversion, and addition and subtraction between decimal notation and other notation
- Mutual conversion between rectangular coordinates and polar coordinates
- Root determining calculation according to Newton's method
- Quadratic equation
- Equation of third degree, etc.

(Statistics)
- n, Σ, $\bar{x}$, δ
- Poisson distribution and binomial distribution
- Normal distribution and percentile
- Estimation of interval of population mean and population variance
- Test of mean and variance
- Test of difference in means, ratio of variances
- Rejection test, test of correlation coefficient, test of goodness of fit
- 2 × 2 contingency table, 2 × n contingency table
- m × n contingency table
- Correction moving average
- Random numbers
- Sum of products, correlation coefficient, linear regression (y = ax + b)
- Exponential regression
- Correction exponential curve
- Logistic curve
- 1-Way layout
- 2-Way layout
- 2-Way layout (with repetitions), etc.

(Measurement)
- Angle calculations
- Open and radiate traverse
- Closed and fixed traverse (Compass rule)
- Inverse calculations of open and radiate traverse
- Coordinate area calculation

- Diagonal and perpendicular area calculation
- Triangle calculations
- Point on straight line and parallel moving point
- Stadia calculation
- Single curve calculations
- Clothoid curve
- Coordinates conversion
- Chamfer calculation
- Intersecting point and perpendicular calculation
- A point at a certain distance from two points (intersecting points of two circles)
- City block vertex calculation
- Division into specified area by specifying a point in a polygon
- Parallel specified area division
- Vertical specified area division
- Longitudinal curve (quadrafic parabola), etc.

(Construction)
- Girder load terms calculation program for reinforced concrete construction
- Force of section of simple beam (uniformly varying load, trapezoidal)
- Correction coefficient of distribution shearing force due to torsion
- Stress calculation of three hinged point gabled roof frame, etc.

(Electrical)
- Impedance in a series circuit
- Impedance in a parallel circuit
- Self-inductance on a straight line
- $\triangle \rightarrow$ Y Translation
- Y $\rightarrow \triangle$ Translation
- Capacitance across two parallel electrodes

(Civil engineering)
- Section, dead load and centroid of a polygon
- Coulomb's coefficient of earth pressure
- Stability of a slope (method of slices)
- Bending stress of simple girder
- Internal force of a simple girder (uniform load)
- Internal force of a simple girder (uniformly varying load), etc.

(Mechanical)
- Graphic calculation
- Distance between two points and angle
- Involute, inverse involute
- The point of intersection of two straight lines P = L/L
- A tangent line from one point P = P/C
- Points of intersection of two circles P = C/C
- A circle tangent to two lines C = L/L
- Intersection of a circle and a line P = L/C
- A line tangent to two circles
- A circle tangent to both a circle and a line C = L/C, etc.

(Office work)
- Days between dates
- Calculation of past and future dates
- Calculation of interest rate on loan
- Calculation of interest on deposits
- Calculation of present value of compound-interest annuity
- Calculation of future & present value (by compound interest)
- Installment calculation
- Calculation of depreciation, etc.

Applications manual is supplied.

Specifications

Model:	PC-1211
Number of calculation digits:	10 digits (mantissa) + 2 digits (exponent)
Calculation system:	According to mathematical formula (with priority judging function)
Program system:	Stored system
Program language:	BASIC
Capacity:	Program memory; Max. 1424 steps
	Data memory; Fixed memory…26 pcs. Flexible memory (common with program memory)…Max. 178 pcs.
	Reserve memory; Max. 48 steps (reserve program: Max. 18 kinds)
	Input buffer; 80 characters
Stack:	For data; 8 stacks
	For function; 16 stacks (in parentheses, 15 levels)
	For subroutine; 4 stacks
	For FOR-NEXT statement; 4 stacks
Calculations:	Four arithmetic calculations, power calculation, trigonometric and inverse trigonometric functions, logarithmic and exponential functions, angular conversion, extraction of square root, sign function, absolutes, integers, and logical calculations.
Editing function:	Cursor shifting (▶,◀) Insertion (INS) Deletion (DEL) Line up and down (↑, ↓)
External memory function:	By using the optionally available cassette interface (CE-121), program, reserve program, and data memory can be saved or loaded to or from cassette tape recorder.
Memory protection:	CMOS battery back-up
Display:	24-digit alphanumeric dot matrix liquid crystal display
Component:	CMOS LSI, etc.
Power supply:	Mercury battery (MR44) × 4 Approx. 300 hours
Power consumption:	5.4V⎓(DC): 0.011W 5.4V⎓(DC): 0.013W (with CE-121)
Operating temperature:	0°C ~ 40°C (32°F ~ 104°F)
Dimensions:	175(W) × 70(D) × 15(H)mm 6-7/8″(W) × 2-3/4″(D) × 19/32″(H)
Weight:	Approx. 170g (0.37 lbs.)
Accessories:	Hard case, battery × 4 (built-in), applications manual, beginner's textbook for "BASIC", template × 2

BASIC language specifications

Command Statement	RUN NEW MEM DEBUG LIST CONT CLEAR INPUT PRINT PAUSE USING LET STOP REM BEEP FOR TO STEP NEXT GOTO GOSUB RETURN IF THEN END AREAD
Operation	+, −, ∗, /, ( ), >, <, >=, <=, <>, =
Function	SIN COS TAN ASN ACS ATN EXP LN LOG INT
	ABS √ DEG DMS SGN DEGREE RADIAN GRAD π ∧
Variable	A ~ Z, A ( ), A$ ~ Z$, A$ ( )
Cassette control	CSAVE CLOAD CLOAD? PRINT# INPUT# CHAIN
Other	, ; : "

* Command, Statement, Function and Cassette control can be used with an abbreviated form. (ex.) PRINT → P.

* Design and specifications subject to change without notice.